NEST OF *FORMICA PROPINQUA* (HYMENOPTERA:FORMICIDAE)

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Abstract.— The nest of the ant *Formica propinqua* W. M. Wheeler is reported from Washoe Co., Nevada.

Little Valley is in the Carson Range, which, according to Fenneman (1931:402), is a subordinate range of the Sierra Nevada, "an uplifted block between parallel faults, a separate range from the Sierra Nevada but included in the same physiographic section. Lake Tahoe occupies the 'moat' between the fault scarps of the main Sierra and Carson Ranges."

Whittell Forest, which is practically coextensive with Little Valley, is a biological research area owned by the University of Nevada at Reno. The legal description places it in T 16 N, R. 19 E., sections 5, 8, 17, 18, 19, 20, in Washoe County, Nevada.

Our study site is in the SW¼ of section 17, about 4 miles east of Lake Tahoe and 20 miles south of Reno. It is in a second-growth pine forest. The range was denuded of its virgin forest after the silver rush of 1859: our site is only 12 miles from Virginia City with its Comstock Lode. A few huge stumps are evidence of the original cover, even after 140 years.

The site is an open portion of a forest of Jeffrey pine (*Pinus jeffreyi*) and lodgepole (*P. contorta*), which is mostly surrounded by dense forest. We staked out in 50 foot squares an area totaling 2.7 acres (=1.1 hectare). On the area there were 210 lodgepole (range 1–34 inches DBH, average 16.6 and median 15 inches) and 27 Jeffrey (range 1–36 inches DBH, average and median 19.8 inches).

In this area we found 35 nests of *Formica propinqua*. We numbered each nest, photographed it, and plotted it on the map. This gives as average of 13 nests per acre (=32 per hectare). We did not find this species anywhere else in the forest. In fact, although we have it at several localities in Nevada and California, we have never seen so many nests in such a small area.

The nests were always in the open, where they were fully exposed to the sun for at least part of the day. We never found them in full shade and hence never in the dense forest.

A nest was always associated with solid dead wood. It could be in or under a prostrate trunk (even a trunk several feet above the ground), in or around a stump, or along a mere slab; the wood might be decayed inside but at least a part of the outside was solid.

The shape of the nest mound was highly variable; we never found two alike; the ants were highly opportunistic in this respect. This is in sharp contrast to certain other members of the *rufa* species-group of *Formica,* which typically construct neat paraboloidal domes. The accompanying photographs illustrate this variability in *F. propinqua.*

The nest material comprised pieces of plant stems about one inch long. These are mixed with smaller plant debris, decayed wood, and soil. In other words, again this species differs from some of its *rufa* relatives, which build typical neat mounds of one or a few kinds of longer pieces of plant materials, e.g., sagebrush twigs, grass culms, pine needles or juniper sprays. In short, the nest mounds of *propinqua* are messy.

The Ants

It would be very interesting to know the population of this entire community. Speculation leads us to think in millions; but it is so easy to underestimate or overestimate an ant population and so difficult to get an actual census, let us be content with *enormous.*

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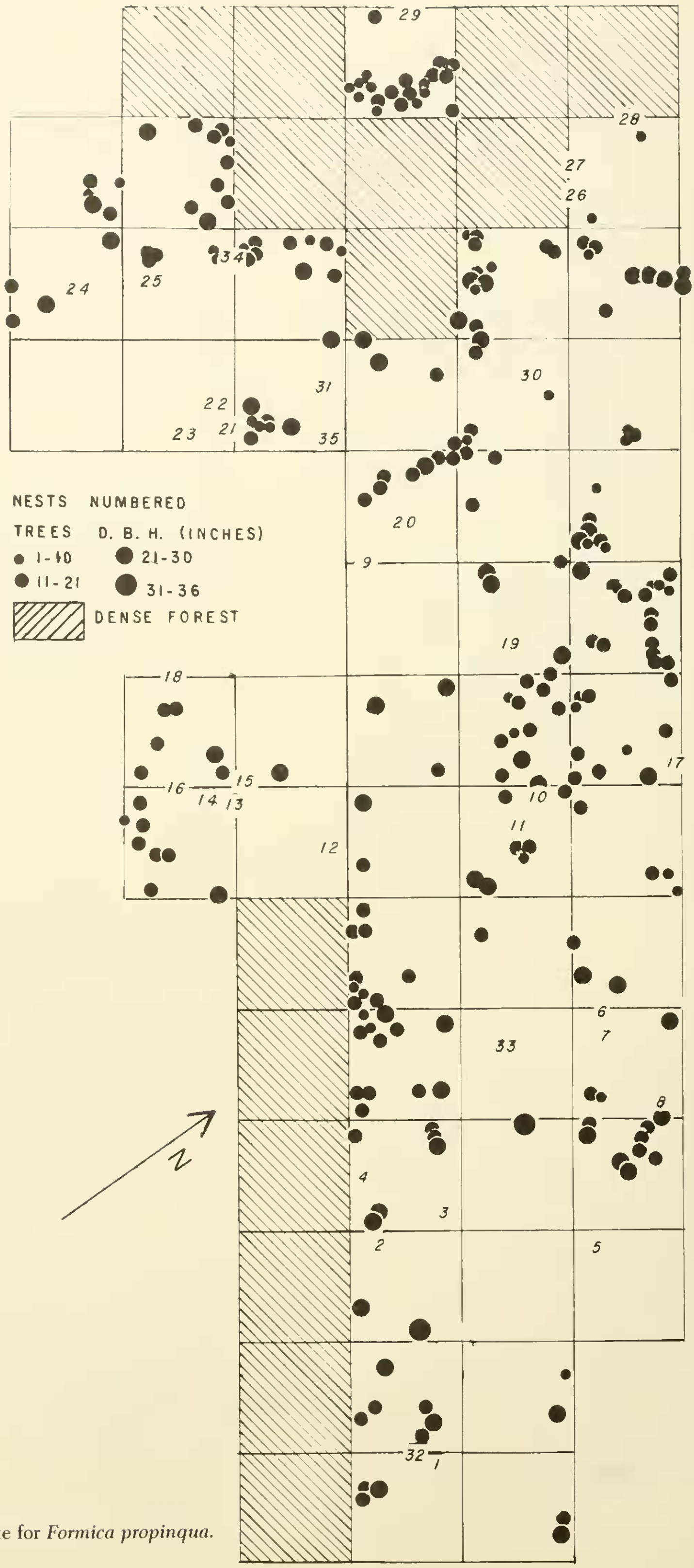


Fig. 1. Map of study site for *Formica propinqua*.



Fig. 2. Photographs of 9 thatch mounds of *Formica propinqua* in the study area.

This leads immediately to the question what is the food supply for such a population? There were not enough other insects (even including the small colonies of other ant species). We found *propinqua* workers tending aphids on pine needles. There were certainly enough aphids to support an enormous ant population. In addition to the honeydew the aphids secrete, the ants could eat some of the aphids for their protein supply.

In some respects the workers of *propinqua* were like their congeners: they were active and aggressive; their bite was annoying and when disturbed they were quick to becloud the atmosphere with formic acid.

EPILOGUE

The above observations were made in 1968. We were ready to continue the study, investigating such topics as population, polycaly and food supply, but our interests were diverted for 10 years. In 1978 we decided to resume the study and revisited the study area. After a prolonged search we found a few moribund nests. What had happened? To be sure, the trees had grown considerably, but there was still ample open space for many nests. The cause of the population crash must remain a myrmecological mystery.

It is interesting to note here that we had previously found in other parts of Little Valley high concentrations of *Manica bradleyi* and *Formica sybilla*. They, too, suffered a population crash (see Wheeler and Wheeler 1970).

LITERATURE CITED

FENNEMAN, N. M. 1931. Physiography of western United States. McGraw-Hill Book Co., New York. 534 pp.

WHEELER, G. C., AND J. WHEELER. 1970. The natural history of Manica. J. Kansas Entomol. Soc. 43:129–162.